UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/244,270	02/03/1999	LORDSON L. YUE	M-7019-US	3568

7590 04/07/2004

VEDDER, PRICE, KAUFMAN & KAMMHOLZ
Christopher J. Reckamp
222 NORTH LaSALLE STREET
CHICAGO, IL 60601

EXAMINER	
CHUNG, DANIEL J	

ART UNIT	PAPER NUMBER
2672	22

DATE MAILED: 04/07/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/244,270	YUE ET AL.	
	Examiner	Art Unit	
	Daniel J Chung	2672	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE ____ MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *02 January 2004*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1,2 and 14-40* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,2,14-22 and 24-40* is/are rejected.

7)☒ Claim(s) *23* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claims 1-2 and 14-40 are presented for examination. This office action is in response to the amendment filed on 1-2-2004.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1-2,14-22 and 24-40 are rejected under 35 U.S.C. 103(a) as being unpatentable over Duluk, Jr. et al (6,597,363) in view of Lentz et al (5,446,836).

Regarding claim 1, Duluk, Jr. et al discloses that the claimed feature of a method comprising (See Fig 24, Fig 31, Fig 47-51: receiving vertex data corresponding to the vertices of a primitive, the vertex data including x-coordinate and y-coordinate position information (See col 44 line 46-49); sorting the vertex data in coordinate dependent fashion (See col 34 line 11-13, col 34 line 34-36, col 44 line 50-64); generating region bits [i.e. "outcodes", "clip codes"] representing the location of the sorted vertex data with respect to a current tile being rendered (See col 54 line 1-6, col 54 line 14, col 81 line 8-33); generating coordinate data representing an initial rasterization starting point estimate when the region bits indicate that at least one of the sorted vertex data lies

within the current tile being rendered and discarding the sorted vertex data of primitives that lie outside the boundary of the current tile being rendered (See col 34 line 11-56, col 77 line 44-col 78 line 20, col 115 line 53+); and providing the initial rasterization starting point estimate to a rasterizer. (See col 76 line 54-col 77 line15, col 80 line 25-48)

Duluk, Jr. et al does not specifically disclose that "generating coordinate data representing an initial rasterization starting point estimate". However, such step ['generating coordinate data for rasterization starting point'] is necessarily required for displaying clipped image in rasterization process. In other word, starting/ending points have to be given or generated, in order to raster any type of polygon/primitives. Therefore, the raster operation of Duluk, Jr. et al inherently meets the limitation in recited claim, as broadly claimed by applicant. [i.e. the method/function of generating rasterization starting point coordinates are not presented] Furthermore, as to the teaching of Lentz et al, it would have been obvious to one skilled in the art to generate the starting raster points during the polygon rasterization. (See "starting point" in Fig 4A, Fig 4B, Fig 5, Fig 6, Fig 9, col 3 line 36-col 4 line 46) The motivation would have been to decrease a substantial time of the rasterization efficiently and to minimize computation time for rasterization (by eliminating the image process on invisible side) [i.e. See 'intersected points of edges of tile/clipping region and primitives' in Fig 50, Fig 51, as suggested in the teaching of Duluk], as such improvement [finding starting point for rasterization] is also advantageously desirable in the teaching of Duluk, Jr. et al for

rendering the image at faster time by reducing the unnecessary processing of portion of clipped or invisible primitive.

Regarding claim 2, Duluk, Jr. et al disclose that generating an orientation bit representing an orientation of a line connecting the first and second vertices of the sorted primitive with respect to a line connecting the first and third vertices of the sorted primitive before generating the initial rasterization starting point coordinates. (See col 34 line 1-2, col 77 line 26-37) Furthermore, using orientation of triangles to classify or organize the triangle variable or/and calculating an orientation of two side of a triangle is necessarily required for classifying the triangle base on its shape [i.e. right oriented triangle, left oriented triangle] in order to render/raster the triangle/primitives effectively with easy manner (See Schroeder (U.S 4,930,091), which previously provided 'Notice of References Cited' in paper No. 4)

Regarding claim 14, claim 14 is similar in scope to the claim 1, and thus the rejection to claim 1 hereinabove is also applicable to claim 14.

Regarding claim 15, refer to the discussion for the claim 1 hereinabove, Duluk, Jr. et al discloses that the initial rasterization starting point estimation circuit includes a trivial accept circuit operative to provide the initial rasterization starting point in response to the region bits. (See col 34 line 11-56, col 77 line 44-col 78 line 20, col 115 line 53+)

Regarding claim 16, refer to the discussion for the claim 1 hereinabove, Duluk, Jr. et al discloses that the vertex data is sorted in y-coordinate fashion and the trivial accept circuit provides the x-coordinate and sorted y-coordinate rasterization starting point of a non-discarded primitive. (See col 34 line 11-13, col 34 line 34-36, col 44 line 50-64)

Regarding claim 17, refer to the discussion for the claim 1 hereinabove, Duluk, Jr. et al discloses that an interception calculation circuit operative to provide a coordinate dependent initial rasterization starting point in response to the region bits and the vertex data. (See col 34 line 11-56, col 77 line 44-col 78 line 20, col 80 line 25-col 82 line 67, col 115 line 53+)

Regarding claim 18, refer to the discussion for the claim 1 hereinabove, Duluk, Jr. et al discloses that the boundary interception point generated by the intercept calculation circuit represents the initial rasterization point starting point coordinate. (See col 34 line 11-56, col 77 line 44-col 78 line 20, col 80 line 25-col 82 line 67, col 115 line 53+)

Regarding claim 19, refer to the discussion for the claim 1 hereinabove, Duluk, Jr. et al discloses that an interception calculation circuit operative to provide a coordinate dependent initial rasterization starting point in response to the region bits

and the sorted vertex data. (See col 34 line 11-56, col 77 line 44-col 78 line 20, col 80 line 25-col 82 line 67, col 115 line 53+)

Regarding claim 20, refer to the discussion for the claim 1 hereinabove, Duluk, Jr. et al discloses that the trivial accept circuit comprises a logic gate coupled to a corresponding subset of the region bits. (See col 125 line 16-col 126 line 33)

Regarding claim 21, refer to the discussion for the claim 1 hereinabove, Duluk, Jr. et al discloses that the logic gate is an AND gate. (See col 125 line 16-col 126 line 33)

Regarding claim 22, Duluk, Jr. et al discloses that the region bits define the top edge, bottom edge, right edge and left edge of a current tile being rendered. (See Fig 50)

Regarding claim 24, refer to the discussion for the claim 1 hereinabove, Duluk, Jr. et al discloses that the x-coordinate and y-coordinate of the initial rasterization starting point to the boundary intercept points. (See col 34 line 11-56, col 77 line 44-col 78 line 20, col 80 line 25-col 82 line 67, col 115 line 53+)

Regarding claim 25, claim 25 is similar in scope to the claim 2, and thus the rejection to claim 2 hereinabove is also applicable to claim 25.

Regarding claim 26, refer to the discussion for the claim 1 hereinabove, Duluk, Jr. et al discloses that determining the relative positioning between the vertices of the primitive. (See col 34 line 11-13, col 34 line 34-36, col 44 line 46-64)

Regarding claims 27-28, claims 27-28 are similar in scope to the claim 1, and thus the rejection to claim 1 hereinabove is also applicable to claims 27-28.

Regarding claims 29-34, Duluk, Jr. et al discloses that the sorting step comprises arranging the position data in descending/ascending y or x-coordinate order. (See col 34 line 11-13, col 34 line 34-36, col 44 line 50-64)

Regarding claims 35-40, Duluk, Jr. et al discloses such claimed clipping process. (See col 34 line 11-56, col 77 line 44-col 78 line 20, col 115 line 53+);

Allowable Subject Matter

Claim 23 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Response to Amendment/Argument

Applicant's arguments with respect to claims 1-2 and 14-27 have been considered but are moot in view of the new ground(s) of rejection. Specifically, in response to the applicant's argument that the cited references do not discloses "sorting vertex data in coordinate-dependent fashion", the newly cited reference (Duluk) clearly teaches such sorting steps. (See col 34 line 11-13, col 34 line 34-36, col 44 line 50-64) Also, Applicant argued that "generating region bits representing the location of the sorted vertex data with respect to a current tile" is not disclosed in the cited references, however, such limitation is shown in the teaching of Duluk. [i.e. "outcodes", "clip codes"] (See col 54 line 1-6, col 54 line 14, col 81 line 8-33) Finally, in response to the argument that the cited references do not disclose that "generating coordinate data representing an initial rasterization starting point estimate...", Examiner assert that such step [generating coordinate data for rasterization starting point] is necessarily required for displaying clipped image in rasterization process, and the raster operation of Duluk, Jr. et al inherently meets the limitation in recited claim, as broadly claimed by applicant. [i.e. the method/function of generating rasterization starting point coordinates are not presented] Furthermore, with in view of Lentz et al, it would have been obvious to one skilled in the art to generate the starting raster points during the polygon rasterization. (See Fig 4A, Fig 4B, Fig 5, Fig 6, Fig 9, col 3 line 36-col 4 line 46) The motivation would have been to decrease a substantial time of the rasterization efficiently and to minimize computation time for rasterization (by eliminating the image process on invisible side), as such improvement [finding starting point for rasterization] is also

advantageously desirable in the teaching of Duluk, Jr. et al for rendering the image at faster time by reducing the unnecessary processing of portion of clipped or invisible primitive. (See the rejections hereinabove)

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Daniel J. Chung whose telephone number is (703) 306-3419. He can normally be reached Monday-Thursday and alternate Fridays from 7:30am- 5:00pm. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael, Razavi, can be reached at (703) 305-4713.

Any response to this action should be mailed to:

Commissioner of Patents and Trademarks

Washington, D.C. 20231

or faxed to:

(703) 872-9314 (for Technology Center 2600 only)

Hand-delivered responses should be brought to Crystal Park II, 2121 Crystal Drive, Arlington, VA, Sixth Floor (Receptionist).

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Technology Center 2600 Customer Service Office whose telephone number is (703) 306-0377.

djc
March 15, 2004

MICHAEL RAZAVI
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2600